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Amendments to the Specification

Please replace paragraph on page 2 beginning on line 6 with the following amended paragraph:

~~This invention~~ The apparatus described and claimed herein relates generally to electronic-optical packages, and more particularly to grids or arrays of such packages supported in such manner as to facilitate their installation and use as in closely assembled or packed configurations. Provisional application serial number 60/405,826 is incorporated herein by reference.

Please replace paragraph on page 4 beginning on line 1 with the following amended paragraph:

~~It is a major object of the invention to provide~~ An exemplary embodiment provides method and means for overcoming the above identified problems. Basically, the improved LED display assembly ~~of the invention~~ comprises:

- a) an array, forming a grid or array of electrical conductors,
- b) light emitting diodes in association with the array and in electrical communication with the conductors that provide power for LED operation,
- c) the array operable or operated to receive heat from the diodes during diode operation, and the array or grid configured for passing coolant fluid for transfer of heat to the fluid.

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Please replace paragraph on page 4 beginning on line 21 with the following amended paragraph:

~~It is another object of the invention to~~
~~provide~~ An exemplary embodiment of the improved
apparatus provides an LED supporting means, such as a grid characterized by ease of conformance to selected shape, curvature, or complex configuration after the LED array is attached to the grid, the grid having flexibility to enable such compliance to desired shaping.

Please replace paragraph on page 5 beginning on line 1 with the following amended paragraph:

~~Another object is to provide means~~ feature is
to effect and/or guide flow of coolant fluid through or along a shape compliant screen incorporating such LEDs.

In this regard, the screen is amenable to fitting to

- i) a substrate on which LED bases are placed, and/or
- ii) a superstrate associated with the screen and LEDs to provide structural strength to the assembly.

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Please replace paragraph on page 5 beginning on line 11 with the following amended paragraph:

Yet another ~~object is to provide~~ exemplary embodiment includes a first protective sheet facing the diodes to pass light emitted by the diode array; and a second sheet at the opposite side of the screen and diodes, the first and second sheets forming an enclosure within which coolant fluid is flowable. The screen itself may be dark or darkened to increase viewing contrast with the LED array, during its operation.

Please replace paragraph on page 5 beginning on line 19 with the following amended paragraph:

~~A further object is to provide the~~ The electrical conductors ~~to~~ may include primary conductors extending generally in one direction, and secondary conductors extending generally in another direction, the LEDs mounted on the primary conductors, and having terminals extending to the secondary conductors for electrical association thereto. In this regard, secondary conductors are typically characterized by one of the following:

- i) substantial spacing therebetween to pass coolant fluid through the screen,

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- ii) reduced spacing therebetween, to
pass coolant fluid primarily
parallel to the screen,
- iii) cross sections which are
substantially less than the cross
sections of primary conductors
which support diodes,
- iv) junctions with diode wires.

Please replace paragraph on page 6 beginning on line 14
with the following amended paragraph:

Yet another ~~object is to provide~~ exemplary
embodiment includes a screen display incorporating
diodes or diode devices, wherein each diode includes a
light emitter or emitters, a transparent container
having a window area, the emitter supported within the
container, and a reflector within the container to
reflect emitted light toward said window. As will
appear, an electrical lead or leads may extend with
helical configuration within the container, such as a
glass tube, to the emitter or emitters. The lead or
leads may have flattened, or generally rectangular
cross sections for stable support of the emitter or
emitters.

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Please replace paragraph on page 7 beginning on line 1 with the following amended paragraph:

A further ~~object~~ exemplary embodiment includes provision of a metallic base carrying the container, and through which said lead or leads extend.

The base typically has an edge portion defining a recess for reception of a support for the diode, allowing diode rotation about the support. Multiple of the diodes may be supported by a conductor or conductors in a screen, and to have their windows oriented to face in the same or selected directions. The diodes may be rotatable about axes defined by their supporting conductors.

Please replace paragraph on page 7 beginning on line 11 with the following amended paragraph:

~~Additional objects include provision of certain power providing features include~~ conductors that comprise first, second, and third pairs of wires to transmit electrical energization to red, green and blue LED pixels, respectively; provision of LED primary, secondary and tertiary wires electrically connected to the red, green and blue pixels, respectively, said primary ~~wire~~ wires clamp, connected to said first pair of wires, said secondary ~~wire~~ wires clamp connected to said second pair of wires, and said tertiary ~~wire~~ wires clamp connected to said third pair

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of wires; provision ~~of~~ for clamped nesting of ~~said~~ such primary, secondary and tertiary wires; provision of certain conductors that extend at an acute angle or angles relative to others of said conductors; provision of protector means such as a plate or plate, or a screen or screens at the front or rear of the grid, and with air passing openings, as will appear.

Please replace paragraph on page 8 beginning on line 3 with the following amended paragraph:

These and other objects and advantages ~~of the invention~~, as well as the details of ~~an illustrative embodiment~~ illustrative embodiments, will be more fully understood from the following specification and drawings, in which:

Please replace paragraph on page 8 beginning on line 11 with the following amended paragraph:

Fig. 1 is a perspective view of one form of ~~the invention~~ grid or screen incorporating LEDs,

Please replace paragraph on page 8 beginning on line 13 with the following amended paragraph:

Fig. 2 is a perspective view of another form of ~~the invention~~ grid or screen incorporating LEDs,

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Please replace paragraph on page 16 beginning on line 1 with the following amended paragraph:

~~In the forms of the invention seen in Figs. 2~~
and 5, the conductors 11 are generally the same as the conductors 11 in Fig. 1, and are spaced apart as seen at 60. The conductors 12 are arranged in side by side pairs, as seen for example at 12' and 12', and 12'' and 12''. Successive pairs of such conductors pass over and under conductors 11, as shown. Like pairs 12' pass together over a conductor 11, along its length, and like successive pairs 12'' pass together over the next conductor 11, along its length in staggered relation in the X-direction in relation to closest pairs 12'; and portions of the pairs 12'' nest between portions of the pairs 12', at locations 62 between conductors 11, as is clear from Fig. 5. A close packed assembly is thereby achieved. As before, LEDs 23 are mounted on exposed tops of sequentially alternate conductors 11b; and LEDs 22 are likewise mounted on exposed tops of sequentially alternate conductors 11a. Each LED has a wire 63 connecting it to the top of a conductor 12 in a pair of such conductors, as at a junction as seen at 64. Insulation is removed or penetrated to enable electrical communication between LED wire 63 and the metal wire within a conductor.

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Please replace paragraph on page 29 beginning on line 11 with the following amended paragraph:

ADDITIONAL FEATURES

~~Large screen~~ As disclosed herein, large-
screen modular displays and signs are enabled, along with various curvatures and complex geometric forms. Also, large scale video displays, and projection displays as for billboards are made possible. Low volume, low mass, low cost, high brightness, high resolution and high efficiency are enabled. Double sided displays can be provided. LEDs can be placed on opposite sides of the screen, and the screen can serve as a pattern for LED placement.

Please replace paragraph on page 30 beginning on line 8 with the following amended paragraph:

~~The invention enables~~ Provision is made for
use of means to use conductive/red LEDs. Screen elements can be connected to side faces of LEDs via conductive adhesives, solder, amalgams, indium, stabilite22, and conductive grease. A metallic superstrate can be used.

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Please replace paragraph on page 30 beginning on line 17 with the following amended paragraph:

~~Superstrate~~ Superstrates may have transparent adhesive layer, thermoplastic, thermoset, and/or pressure sensitive features.

Please replace paragraph on page 33 beginning on line 15 with the following amended paragraph:

OPTICAL

SPATIAL TUNING: Benefits accruing from the ability to aim the radiation from the emitters to the target include a reduction in emitter cost and/or electrical system cost and/or operating cost and/or increased radiation delivered to the target. The ~~OnScreen~~ herein described pixel package can be rotated as for example 360 degrees around it's axis and 360 degrees around an axis perpendicular to its' axis, and as a consequence has complete freedom of movement in both elevation and azimuth.

Please replace paragraph on page 34 beginning on line 7 with the following amended paragraph:

ANGULAR APERTURE CONTROL: Minimizing the radiation beyond the angular extent needed for the task is an important element in minimizing cost. Maximizing the aperture to emitter size ratio allows a

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minimization of the angular extent of the output radiation. The herein described ~~OnScreen~~ pixel design allows for a minimization of the output radiation by minimizing the emitter array size via close emitter spacing and a narrow gauge substrate and by maximizing the aperture size for a given pixel spacing.

Please replace paragraph on page 34 beginning on line 17 with the following amended paragraph:

BIFACIAL DISPLAY: Bifacial ~~OnScreen~~ displays are possible ~~by the invention,~~ with a single array of bifacial pixels or via a forward and rearward spaced pixel arrays, which may provide or allow differing energizing content to the displays. The ~~OnScreen~~ pixel package allows mounting in front of or in back of the display ''plane''. This allows one face to use pixel packages mounted on the front of the vertical wires and facing forward, and the opposite face to use pixel packages mounted on the opposite side of the wires and facing rearward. The packages may be displaced vertically to allow clearance.

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Please replace paragraph on page 35 beginning on line 6 with the following amended paragraph:

OPTICAL EFFICIENCY: The ~~OnScreen~~ pixel design allows for use of a linear emitter array coupled with a visible mirror film parabolic trough, to control radiation in the vertical axis. Horizontal axis radiation may be controlled by end reflectors of similar material and these may be curved to aid in the control of the angular extent of the radiation in the horizontal axis. This design minimizes the average number of reflections and provides for high efficiency for each reflection. The pixel optical system may be contained within a cylindrical glass envelope for environmental protection. Additional benefits of such an envelope include:

Please replace paragraph on page 37 beginning on line 5 with the following amended paragraph:

THERMAL

The lifetime and efficiency of semiconductor devices (LEDs) degrades strongly with increasing temperature. ~~The invention allow~~ Provision is made for reducing the thermal resistance between the emitters and the local environment, and thereby ~~increases~~ increasing lifetime, reliability, durability, and

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efficiency and reduce operating cost, pursuant to
provision of the following:

Please replace paragraph on page 38 beginning on line
22 with the following amended paragraph:

ELECTRICAL

~~The invention enables~~ Provision is made for
use of active and/or passively addressed pixels. Local
(pixel based) electronics may be included in the pixel
package and placed on the emitter substrate, behind the
reflector, in the aluminum bushing and/or in the
hemispherical cap. Local electronics may vary with
application and include capacitors, resistors,
inductors, diodes, transistors, standard integrated
circuits such as 555 timers or application specific
integrated circuits. Multiplexing may be used to
reduce the cost of the electrical system, and the
ability to multiplex is greatly increased by minimizing
the pixel output radiation required by means discussed
in the above optics section.

Please replace paragraph on page 39 beginning on line
13 with the following amended paragraph:

~~The invention provides~~ Provision is made for

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for use of in-field replaceable pixels that may be made to be replaceable from either side of the screen.

Please replace paragraph on page 39 beginning on line 13 with the following amended paragraph:

~~The invention allows for use~~ Use of vertically oriented column/common wires and 45 degree oriented row/addressing wires ~~to allow~~ allows large scale seamless signage and displays with all pixels/electronics addressable/accessible from the top or the bottom of the screen.

Please replace paragraph on page 40 beginning on line 1 with the following amended paragraph:

MECHANICAL/STRUCTURAL

~~The invention allows~~ Provision is made for use of robust ~~OnScreen~~ signage/displays created by arranging a parallel array of large diameter vertically oriented common/column wires in tension between horizontal upper and lower rigid members. The upper end of each vertical wire may be formed into a loop and affixed to and electrically isolated from the upper rigid horizontal member. The lower end of each vertical wire may be formed into a loop and elastically attached to and electrically isolated from the lower

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rigid member by a stainless steel extension spring. Both upper and lower mounts may serve to prevent rotation of the vertical wires around their own axes. A parallel array of 45 degree row wires may be connected in tension between the upper and lower rigid horizontal members by means analogous to those described for the vertical wire array. The 45 degree row wires may be constructed of a large diameter electrically insulated central wire helically wound with a 6 strand small diameter multifilar insulated wire array. The multifilar wire array includes paired red, green, and blue wires. The 45 degree wire array may be placed behind the vertical wire array and the pixel packages may be mounted in front of the vertical wires. The pixel packages may be mechanically connected to the vertical wires by plastic deformation of the pixel package aluminum bushing and/or the wire and/or by adhesives. The pixel common wire may be electrically connected to the large diameter vertical common wire through the aluminum bushing via wirebonding or pressure welding or directly to the larger diameter wire by soldering or pressure type connection. Red, green, and blue wires emanating from the pixel may be connected to the 45 degree row wires by soldering or by pressure type contacts.

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Please replace paragraph on page 41 beginning on line 17 with the following amended paragraph:

~~OnScreen signage~~ Signage and displays of simple or complex face or form (circular or hyperbolic cylinders, cones and conoids, hyperbolic paraboloids) may be assembled on site ~~of~~ or shop fabricated by simple techniques that lend themselves to manual or automated fabrication.

Please replace paragraph on page 41 beginning on line 23 with the following amended paragraph:

~~Important~~ Other important advantages of the invention are listed as follows:

Please replace paragraph on page 42 beginning on line 14 with the following amended paragraph:

4. In Field Pixel Replaceability: The ability to replace individual pixels in the ~~filed~~ field allows reduced maintenance cost.

Please replace paragraph on page 42 beginning on line 17 with the following amended paragraph:

5. Freedom of Form: ~~OnScreen~~ Array construction allows a wide variety of signage/display forms. One example is a vertical axis cylindrical display viewed from the inside and/or the outside and with varying degree of array transparency determined by